

REMARKS

Applicant appreciates the thorough examination of the present application that is reflected in the Official Action of May 31, 2006 (the "Official Action"). Applicant particularly appreciates the indication in the Official Action that Claims 49-51 contain allowable subject matter. In addition, independent Claims 1 and 46 have been amended to clarify the patentable distinctions over the cited references. Applicants respectfully request reconsideration of the present application and allowance of pending Claims 1, 4-6, 12, 13, 17, 21, 23, 25-27 and 46-53 in view of the following remarks.

Furthermore, Applicant respectfully requests entry and allowance of previously withdrawn Claims 2, 3, 14, 16 and 18-20 as depending on an allowable generic claim.

1. The Objections to the Drawings Have Been Overcome

The Official Action objected to the drawings under 37 CFR 1.83(a). In particular, the Official Action stated that the drawings must show every feature of the invention specified in the claims. With respect to etching the substrate subsequent to removal of material utilizing a laser, blanket annealing of a substrate utilizing a laser, and singulation of a substrate into individual light emitting devices, Applicant notes that Claims 15, 39-44, 56-62 and 75 have been cancelled. Accordingly, the objection to the drawings as failing to show every feature of Claims 15, 39-44, 56-62 and 75 is moot.

With respect to a micro mask between the mask layer and the substrate, Applicant has amended Figures 9 and 10 as shown in the Replacement Sheet included herewith to show the location of a micro mask 315 between the mask 310 and the substrate 100. Support for this amendment is found, for example, at page 15, lines 16-20 of the specification. The specification has also been amended to insert a reference number for the micro mask.

2. The Objections to the Title and Claims Have Been Overcome

Claims 41 and 53 were objected to under 37 CFR 1.75(c). Claim 41 has been cancelled, while Claims 52 and 53 have been amended to correct the spelling error

identified by the examiner. Applicant has amended the Title consistent with the Examiner's suggestion.

3. The Amended Claims Are Patentable Over the Cited References

Claim 1 has been amended to independent form including the recitations of Cancelled Claims 22 and 24. As amended, Claim 1 recites as follows:

1. A method of forming light extraction features for a light emitting device having a substrate and a semiconductor light emitting element on the substrate, comprising:

shaping a surface of a semiconductor layer of the light emitting device utilizing a laser to define three dimensional geometric patterns in the layer, wherein shaping a surface of a semiconductor layer utilizing a laser to define three dimensional geometric patterns in the semiconductor layer comprises:

patterning a mask layer on the semiconductor layer using a laser to remove mask material; and

etching the semiconductor layer using the patterned mask layer to define the three dimensional geometric patterns.

Claim 22 was rejected under 35 USC 103(a) as obvious over WO 02/41362 to Eliashevich et al. (Eliashevich) in view of "Laser Micro-Machining of High Density Optical Structures on Large Substrates," by Boehlen et al. (Boehlen). The Official Action asserts that Eliashevich teaches the claimed invention except for applying laser light to the layer using mask projection optics that applies the light in a predetermined polymer mask pattern to the layer using a laser to remove mask material. Official Action, p. 7. However, Applicant notes that Claim 1 recites a method of forming light extraction features for a light emitting device, including shaping a surface of a semiconductor layer of the light emitting device utilizing a laser to define three dimensional geometric patterns in the layer. In contrast, Eliashevich relates to a method of separating individual electronic devices. Eliashevich, Abstract. While the method described in Eliashevich may result in the formation of an LED chip having slanted sidewalls, the method of Eliashevich does not shape a surface of a

semiconductor layer of the light emitting device utilizing a laser to define three dimensional geometric patterns in the layer, as recited in Claim 1.

Furthermore, Boehlen does not teach patterning a mask layer on a semiconductor layer of a light emitting device using a laser and etching the semiconductor layer using the patterned mask layer to define three dimensional geometric patterns in the semiconductor layer, as recited in Claim 1. Rather, Boehlen relates to micromachining three dimensional features into substrates using laser ablation through stepped masks. Eliashevich, Abstract. For example, Eliashevich discusses machining polymer panels that are then electroformed to produce a mold for replication. Eliashevich, Abstract. Eliashevich does not teach patterning a mask layer on a semiconductor layer by removing material from the mask layer using a laser and then etching an underlying semiconductor layer using the patterned layer as a mask layer as recited in Claim 1.

Accordingly, even if Eliashevich and Boehlen were combined, the resulting combination would not provide each and every limitation of Claim 1, as amended. Applicant therefore respectfully submits that the rejection of Claim 1 has been overcome, and respectfully requests that the rejection be withdrawn.

Claim 46 was rejected under 35 USC 103(a) as obvious over Boehlen in view of EP 1263058 to Suehiro et al. (Suehiro). As noted above, Boehlen does not teach patterning a mask layer on a substrate using a laser to remove material from the mask layer, and etching the substrate using the patterned mask layer to define the three dimensional geometric patterns, as recited in Claim 46. Suehiro does not supply the missing limitations. Accordingly, Applicant respectfully submits that the rejection of Claim 46 has been overcome, and respectfully requests that the rejection be withdrawn.

The dependent claims are patentable at least per the patentability of Claims 1 and 46 from which they depend. In addition, many of the dependent claims are separately patentable. For example, Claim 21 recites that the geometric patterns comprise randomization features formed in the semiconductor layer. To the extent that the cited references teach geometric patterns in a semiconductor layer, they appear to be regular patterns and not randomization features. Likewise, Claim 25 recites wherein patterning a mask layer on the semiconductor layer using a laser

comprises patterning a master template with a laser, and embossing the mask layer using the master template. As noted above, Boehlen relates to micromachining three dimensional features into substrates. Boehlen does not teach or suggest patterning a master template with a laser and embossing a mask layer using a master template.

4. Consideration of Previously Withdrawn Claims

Applicant respectfully requests entry and allowance of previously withdrawn Claims 2, 3, 14, 16 and 18-20 as depending on an allowable generic claim.

CONCLUSION

Applicant again appreciates the thorough examination of the present application. Applicant has now shown, however, that the claims, as amended, are neither anticipated by nor obvious in view of the cited reference(s). Accordingly, Applicant respectfully requests withdrawal of the outstanding rejections and allowance of the present application.

Respectfully submitted,

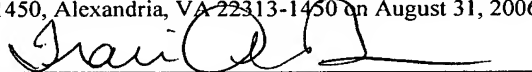


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